

5 **MOBILE PHASE GRADIENT GENERATION MICROFLUIDIC DEVICE**

ABSTRACT OF THE DISCLOSURE

The present invention relates to a microfluidic device for separating the components of a fluid sample. A cover plate is arranged over the first surface of a substrate, which, in combination with a microchannel formed in the first surface, defines a separation conduit for separating the components of the fluid sample. An inlet port in fluid communication with the separation conduit allows a mobile phase containing a gradient of a selected mobile-phase component to be introduced from an integrated gradient-generation means to the separation conduit. A method is also provided for separating the components of a fluid sample using a mobile phase containing a gradient of a selected mobile-phase component, wherein the gradient is generated within a small volume of mobile phase.